

REMARKS / ARGUMENTS

Claims 9-12 are pending in the application, certain additional originally submitted and newly submitted claims have been withdrawn from consideration in two previous restriction requirements.

The application stands as being rejected with no claims allowed as is announced in the captioned Examiner's Action. Rejection is based on the provisions of 35 U.S.C. 102 in view of disclosure included in the published patent application 2001/0040675 of R.J. True.

In response, applicant herein presents remarks of explanation, argument and clarification. Turning to the rejected application claims 9-12, applicant notes the True patent indeed discloses the fabrication of a MEMS device, a MEMS device embodied as an array of hinge mounted optical reflectors and achieved with the use of semiconductor materials and semiconductor processing steps. Notwithstanding these similar aspects of the True MEMS device with applicant's, invention several areas of significant distinction between applicant's invention and the True disclosure also appear. These distinctions may be viewed as involving a difference between operating structure and fabricating structure.

To appreciate these distinctions it may be helpful to consider that the True MEMS device is fundamentally an array of hinge-mounted movable mirrors in which the disclosed hinge movement is a MEMS operating movement occurring as a result of electrostatic energization of the control electrode located close by the MEMS mirror element. This achieves a rotation of the mirror element about an axis traversed by the True mirror hinge elements. In the True MEMS device of FIG. 5A for example the hinged mirror moves upward about an axis passing horizontally through the posts 53 and by way of bending in the pair of flexure hinges 50. This hinge 50 bending is enabled by the thinner, less rigid hinge area 51. Similarly, in the True FIG. 8A drawing rotation of the movable active element mirror 61 occurs by way of bending in the hinge area located to the right of the active mirror element 61 and connecting with the substrate 60. Another view of this FIG. 8A mirror rotation is presented in the inverted FIG. 8B drawing of the True patent. These operational rotational movements occur as a result of electrical energization of the control electrodes appearing below the mirror elements 61 and 63 in the FIG. 8B drawing.

Applicant's invention differs sharply from these attributes of the True MEMS device. Applicants have described, and recited in the rejected claims, a two module or two component MEMS device fabricated in a first relative positioning of the two components

and then physically disposed in a second relative positioning of the two components for completion and using of the device. Moreover these two components of applicant's MEMS device are placed in this second relative positioning with the aid of specific fabrication used structural elements, structural elements recited in applicant's rejected claims. Movement of applicant's components into this second relative fabrication positioning in fact involves rotation of the second component using applicants' disclosed hinge element, fabrication hinge elements that are distinctly separate from any operational hinge used during electrical deflection of the MEMS mirror element. The True reference patent appears devoid of hinges of applicants' fabrication used type.

Electrically energized movement of the mirror or other MEMS element in applicant's invention can of course occur after the second component has been disposed into the second relative positioning and such movement involves a control electrode as used in the True and other MEMS devices. This is however a MEMS operating event.

The movement of MEMS components from the first to the second relative positions in applicant's MEMS device is, however, a fabrication event and is accomplished by way of manual manipulation or some force other than that of an electrical energization. Moreover, applicant's invention provides for the locking of one MEMS component in a selected position with respect to the other MEMS component during the fabrication event using specific locking structure provided in the fabrication process. This locking structure includes a temporary and sacrificial substitute for the removed substrate of the movable MEMS component and provides holding of components in a desired relationship for fabrication completion. The most comparable fabrication step in the True MEMS device is disclosed in True's paragraph [0025] and includes no fabrication hinge or locking structure as recited in applicants' rejected claim 9.

Thus it is significant to note that operational rotational movements are the hinge movements provided-for in the True MEMS devices. Especially it is notable that there is no provision of rotation locking devices or of movements of elements other than the mirror in the True disclosure.

In view of these explanations, it may be considered that applicant's rejected claim 9 is therefore distinguished over the True reference patent by at least the following recited structure:

1. The "flexible tensile members" recited as part of the recited structure in the third paragraph of the claim, these flexible tensile members are a part of applicants' fabrication structure;
2. The "physical support element latching member" recited as part of the fabrication structure in the fourth paragraph of the claim;
3. The "position of mutually locked engagement--" recited as part of the fabricated structure in the fourth paragraph of the claim;
4. The "selected off-chip and rotated about said hinge location--" recited as part of the fabricated structure in the fourth paragraph of the claim;
5. The "Rotationally mergeable" apparatus recited as part of the preamble in the first paragraph of the claim. The True patent does not disclose rotation as a part of paragraph [0025] or step 42 in FIG. 7.

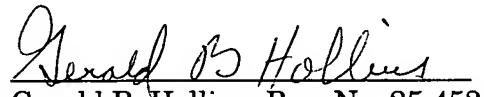
With respect to applicant's rejected claim 10, applicant respectfully submits that the True elements 51 and 53, as are expressly cited in the Examiner's Action, are defined in the True specification paragraph [0025] to be "removed reinforcing layer" and a "post" respectively rather than the tongue and slider elements asserted in the Examiner's Action.

Claims 11 and 12 are dependent on claim 9 and are believed at least carried as to patentability by the discussed claim 9 limitations.

Applicant has requested amendment of the application specification at paragraphs [0030]-[0036] above. This change reflects the now exclusively apparatus nature of the application.

In view of the remarks of explanation and distinction provided herein, the application is believed to be in a condition permitting allowance, such an allowance at the earliest possible moment is respectfully solicited.

Respectfully submitted,



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